

1 WE CLAIM:

1 1. A disk drive comprising:

2 (a) a disk comprising a plurality of data tracks, each data track comprising a plurality of
3 data sectors and embedded servo sectors, each embedded servo sector comprising a
4 plurality of product servo bursts written at a radial resolution finer than the radial
5 resolution of the data tracks;

6 (b) an actuator arm;

7 (c) a head attached to a distal end of the actuator arm, wherein the actuator arm is rotated
8 to actuate the head radially over the disk to write data to and read data from the data
9 sectors; and

10 (d) a disk controller for self servo writing the disk by:
11 reading reference servo bursts from the disk, wherein the reference servo bursts
12 are written to the disk using an external servo writer at a radial resolution
13 coarser than the radial resolution of the product servo bursts;
14 processing the reference servo bursts to maintain the head in a substantially
15 circular trajectory with respect to the disk to write a first set of the product
16 servo bursts to the disk; and
17 processing the reference servo bursts to maintain the head in a substantially spiral
18 trajectory with respect to the disk to write a second set of the product servo
19 bursts to the disk.

1 2. The disk drive as recited in claim 1, wherein the reference servo bursts are written to the
2 disk at a radial resolution equal to half the radial resolution of the product servo bursts.

1 3. The disk drive as recited in claim 1, wherein a single product servo burst is written
2 circumferentially to the disk between two reference servo bursts.

- 1 4. The disk drive as recited in claim 1, wherein a plurality of product servo bursts are written
- 2 circumferentially to the disk between two reference servo bursts.
- 1 5. The disk drive as recited in claim 1, wherein the second set of product servo bursts are
- 2 written to the disk at an oblique angle relative to the first set of product servo bursts.
- 1 6. The disk drive as recited in claim 1, wherein the disk controller writes the first set of
- 2 product servo bursts to the disk over a single stroke of the actuator arm.
- 1 7. The disk drive as recited in claim 1, wherein the disk controller writes the second set of
- 2 product servo bursts to the disk over multiple strokes of the actuator arm.
- 1 8. The disk drive as recited in claim 1, wherein the disk controller erases the reference servo
- 2 bursts.
- 1 9. The disk drive as recited in claim 1, wherein the disk controller overwrites the reference
- 2 servo bursts with user data.

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- 1 10. A method of servo writing a disk drive, the disk drive comprising a disk, an actuator arm,
2 and a head attached to a distal end of the actuator arm, the method comprising the steps
3 of:
 - 4 (a) using an external servo writer to write a plurality of reference servo bursts to the disk;
 - 5 (b) reading the reference servo bursts from the disk and maintaining the head in a
6 substantially circular trajectory with respect to the disk to write a first set of product
7 servo bursts to the disk; and
 - 8 (c) reading the reference servo bursts from the disk and maintaining the head in a
9 substantially spiral trajectory with respect to the disk to write a second set of product
servo bursts to the disk.
11. The method as recited in claim 10, wherein the reference servo bursts are written to the
disk at a radial resolution equal to half the radial resolution of the product servo bursts.
12. The method as recited in claim 10, wherein a single product servo burst is written
circumferentially to the disk between two reference servo bursts.
13. The method as recited in claim 10, wherein a plurality of product servo bursts are written
circumferentially to the disk between two reference servo bursts.
14. The method as recited in claim 10, wherein the second set of product servo bursts are
written to the disk at an oblique angle relative to the first set of product servo bursts.
15. The method as recited in claim 10, wherein the first set of product servo bursts are written
to the disk over a single stroke of the actuator arm.
16. The method as recited in claim 10, wherein the second set of product servo bursts are
written to the disk over multiple strokes of the actuator arm.

1 17. The method as recited in claim 10, further comprising the step of erasing the reference
2 servo bursts.

1 18. The method as recited in claim 10, further comprising the step of overwriting the reference
2 servo bursts with user data.

1 19. A disk drive comprising:

2 (a) a disk comprising a plurality of data tracks, each data track comprising a plurality of
3 data sectors and embedded servo sectors, each embedded servo sector comprising a
4 plurality of product servo bursts written at a radial resolution finer than the radial
5 resolution of the data tracks;

6 (b) an actuator arm; and

7 (c) a head attached to a distal end of the actuator arm, wherein the actuator arm is rotated
8 to actuate the head radially over the disk to write data to and read data from the data
9 sectors;

10 wherein:

11 the plurality of product servo bursts in a servo sector comprises a first set of product
12 servo bursts and a second set of product servo bursts; and
13 the second set of product servo bursts are written to the disk at an oblique angle
14 relative to the first set of product servo bursts.

15 20. The disk drive as recited in claim 19, wherein:

2 (a) the first set of product servo bursts are written to the disk while tracking reference
3 servo bursts in a substantially circular trajectory; and

4 (b) the second set of product servo bursts are written to the disk while tracking reference
5 servo bursts in a substantially spiral trajectory.